Subparagraph (e)(3) involves the issue of concurrent changes in railroad operations. Railroads intending to implement products covered by subpart H may intend to change operational characteristics at the same time to take advantage of the benefits of the new technology. FRA envisions increased train volumes, passenger volumes, and/or operating speeds to be likely changes to accompany implementation of subpart H products. The proposal would require the railroad to analyze the total change in risk, then separately identify and distinguish risk changes associated with the use of the product itself from risk changes due to changes in operating practices (i.e., risk changes due to increased/decreased operating speed, etc.). FRA believes this procedure will be necessary to make an accurate comparison of the relevant risks for purposes of determining compliance with the minimum performance standard in § 236.909(a).

The second sentence of subparagraph (e)(3) concerns changes in operating speeds related to required signal and train control systems for passenger and freight traffic. In such case, the provisions of § 236.0 would normally apply, mandating the use of certain technologies/operating methods. Thus, for changes to operating speeds, the previous condition calculation must be made according to the assumption that such systems required by § 236.0(c) (and § 236.0(d), if applicable) are in use. This proposed requirement ensures that a minimum level of safety set by § 236.0, which would otherwise normally apply, is respected and not circumvented.

In addition to including an adjustment in the previous condition to account for increases in train speeds as addressed in § 236.0, FRA also intends that an adjustment be made if necessary to take into consideration the need for fluid traffic management. For instance, if the railroad proposed to implement a non-vital overlay train control system in dark territory in connection with major projected increases in traffic, the previous condition would need to be adjusted to assume installation of a traffic control system (which, under the options available under current Part 236, would be needed as a practical matter to move the increased numbers of train across the territory). Since research in connection with the Corridor Risk Assessment Model indicates that operations in dark territory have a much higher risk of collision than in signal territory (when normalized on a train mile basis), this adjustment will set the safety baseline at an appropriate level for purpose of making the necessary comparison. Failure to make this adjustment within the previous condition would at least theoretically permit a progressive worsening of the safety situation as new technology is brought on line.

(e) ***How are safety and risk measured for the full risk assessment?***

Risk assessment techniques, including both qualitative and quantitative methods are recognized as providing credible and useful results for purposes of this section if they apply the following principles:

(1) Safety levels must be measured using competent risk assessment methods and must be expressed as the total residual risk in the system over its expected life cycle after implementation of all mitigating measures described in the PSP. Appendix B - Risk Assessment Criteria provides criteria for acceptable risk assessment methods. Other methods may be acceptable if demonstrated to the Associate Administrator for Safety to be equally suitable.

(2) For the previous condition and for the life-cycle of the product, risk levels must be adjusted for exposure. Exposure must be expressed as total train miles (and, as applicable, total passenger miles) traveled per year. Severity must identify the total cost, including fatalities, injuries, property damage, and other incidental costs, such as potential consequences of

hazardous materials involvement, resulting from preventable accidents associated with the function(s) performed by the system. A railroad may, as an alternative, use a risk metric in which severity is measured strictly in terms of fatalities.

(3) If changes in the physical or operating conditions on the railroad are planned coincident with introduction of or within the expected life cycle of the product subject to review under this subpart, the previous condition shall be adjusted to reflect any associated impact on risk. In particular, the previous condition must be adjusted for assumed implementation of systems necessary to support higher train speeds as specified in § 236.0, as well as track and other changes required to support projected increases in train operations.